Cognizant Academy

Full Stack Prep-up Learning Guide Java Track



Why do we need this Full Stack Prep-up Internship Program?

Full Stack Prep-up Internship program engages young talents with a comprehensive learning pathway, giving these millennials an opportunity to become a Full Stack Engineer, understand the corporate environment and groom themselves even before they join us.

Cognizant emphasizes on Learner Autonomy where students take charge of their own learning pathway, with the available tools and resources. More focus is given to "learning" than "teaching". Get ready to embark your own learning adventure!

Program at a glance

Full Stack Prep-up Internship Program has 3 stages:

- Stage 1 (Week 1 Week 3)
- Stage 2 (Week 4 Week 6)
- Full Stack Prep-up Modules (Week 7 Week 16)

Program Highlights

- The complete learning journey is formalized using adult learning principles, where problem solving and applying the skills gained are given more importance than conceptual learning.
- Learner Autonomy is implemented via Flipped Classroom, where the learning platform offers world class learning resources, and students would not be constrained by tutelage of an instructor.
- Get mentored by Subject Matter Experts, whose motivation and guidance will help you accelerate
 in the learning journey.

Learning Journey with Flipped Classroom

This program encourages you to be more autonomous learners during out-class self-learning hours, completing the learning objectives on your own pace and style, and get ready for the inclass practice time.

The complete learning path from Stage 2 onwards, is set in the <u>GEN C Learn</u> <u>Platform</u>, which you can login with SSO.

Flipped Classroom

Self-Learning Hours

- Go through the Learning Objectives
- •Try to accomplish the learning objectives by accessing learning resources

Practice Time

- •Get guidance from Subject Matter Expert
- Deep dive on to the learning concepts and solve a problem statement

Recommended Program Sequence

The learning journey contains 3 stages:

- ➤ Stage 1 Core Programming Fundamentals
- Stage 2 Deep Learnings
- ➤ Stage 3 & 4 FSE modules
- ➤ My First Pod Engagement Project Case study done as a team

Stage 1 - Core Programming Fundamentals

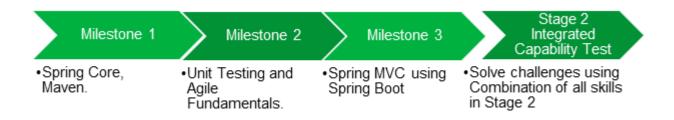
Stage 1

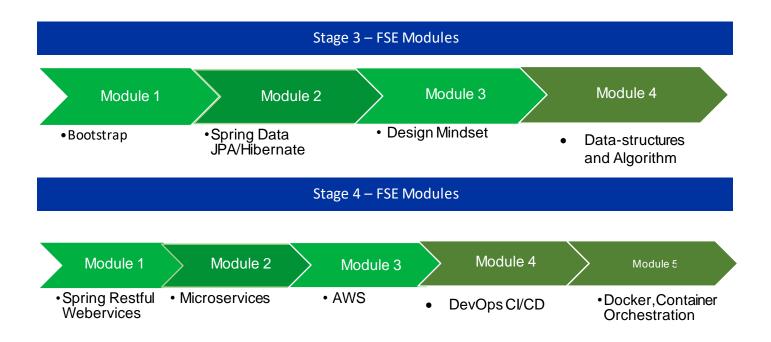
- Web Designing with HTML5/CSS3
 Programming in Java
- · Programming with Database

Stage 1 Integrated Capability Test (ICT)

Solve a case study in combination of Skills learnt in Refresher phase

Stage 2 - Deep Learnings





This stage would be executed with complete trainer guidance outside of the Tekstac platform. The software's on the local machine will be used to work on the enablement and case study requirements. The modules in this stage would follow a model of Enablement through Objectives (not thru Udemy), practice through Hands-on question.

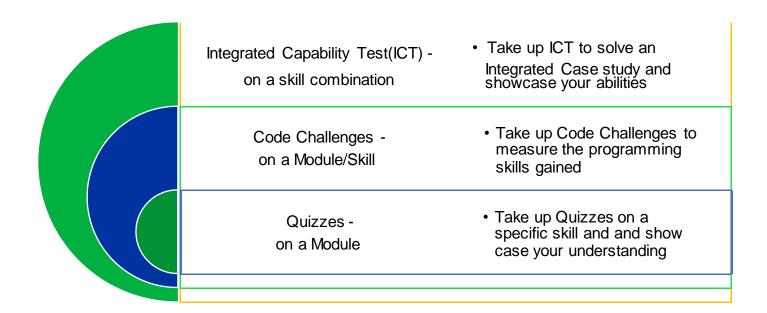
As part of the knowledge check, there would be case studies, as provided in the previous stages. It is split into Practice check and Final check. The case study in Practice check would be done with complete trainer guidance. The case study in Final check would be very similar to that of the Practice check. The participant will implement it without the trainer support.

Key Learning Components of the Program

Cognizant has partnered with Udemy to provide world class learning videos for the evolving future of work. These videos are tailored in the learning path, empowering you to plan and learn at your style.

The program also connects you with Subject Matter Experts to get the professional guidance on your queries in the learning journey.

The program continuously evaluates if you are able to apply those self-learnt skills to solve a business problem. Depicted below are the 3 key learning components, which are distributed across the learning journey that does the continuous evaluation.



Program Completion Criteria

Complete all the mandatory Coding Challenges and ICT with benchmark of 70% in both the stages. Coding challenges will be scheduled on the last day of the Milestone. ICT will be scheduled on the last day of the Stage.

Stage 1: Milestone 1

Overall Duration: 5 days

Milestone 1 will be focusing on HTML, CSS and JavaScript along with behavioral skills*

Udemy learnings are recommended in the Platform to understand the fundamental concepts. Apply the concepts learned and solve the Hands-on and Practice Case studies as recommended below.

Day 1, 2

Note: Behavioral skills will be covered in this week for 3 hours.

HTML5, CSS3

Learn the basics of HTML5 & CSS3

Learn and Practice:



Responsive Web Design: HTML5 + CSS3 for Entrepreneurs 2018

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
 - Lets Learn Some HTML 5
 - CSS3 & First Project
- Implement the examples along with the author.



<u>Devtools Pro: The Basics of Chrome Developer Tools</u> Visual Studio Code Features

• Learn the sections listed below in this Udemy course

Go through the below topics to enhance the learning.

- RWD Introduction
- Media Queries
- HTML5 Events
- HTML5 Geo location
- HTML5 Web Storage
- HTML5-Web SQL Database
- WEB Forms 2.0

Mandatory Hands-on (Platform: Tekstac)

- Simple Calculator
- Learning Material Styling
- Feedback Details
- Bill Calculator
- Trainer Feedback Rating Chart

Additional Hands-on

Rate Card For Boat Riding



JavaScript

Learn the basics of JavaScript

Learn and Practice:

Javascript basics for beginners



- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
 - Getting Started
 - o Basics
 - Operators
- Implement the examples along with the author.

Go through W3Schools web pages for learning below specific topics

schools

Form Validation

- JavaScript Form Validation
- JavaScript can validate numeric input
- Data Validation

String Methods

- String Length
- The substring() Method
- String.trim()

JavaScript HTML DOM

- The HTML DOM (Document Object Model)
- What is DOM?
- What is the HTML DOM?

Window alert() Method

- Definition and Usage
- Example

Javascript Arrays

All topics except Associative Arrays

JSON

Regular Expression

isNan() function

indexof function

Go through **javascript-coder.com** web page for learning form submission

javascript-

JavaScript Form Submit Example

coder.com

• Refer code example in this web page

Mandatory Hands-on (Platform: Tekstac)

- ACTB Connection Portal
- EMI Calculator

Additional Hands-on

Fixed And Reducing Interest Loan Estimator

Technical Quizzes:

- Quiz 1 HTML 5 & CSS3
- Quiz 2 Java Script



Practice Case Study

- Understand truYum use cases (<u>truYum-use-case-specification.pdf</u>)
- Go through Web UI specification of truYum (truYum-html-css-javascript-specification.pdf)
- Develop web pages using HTML, CSS and JavaScript for truYum



Assess-Type-1: Code Challenge (Platform: Tekstac)

• All code challenges

Stage 1: Milestone 2 - Schedule

Overall Duration: 3 days

Milestone 2 will be focusing on SQL Programming

Udemy learnings are recommended in the Platform to understand the fundamental concepts. Apply the concepts learned and solve the Hands-on and Practice case study as recommended below.

Day 6

Note: Behavioral skills will be covered in this week for 3 hours.

Database design

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Relational Database Design

· Learn all the sections in this Udemy course

DDL Commands, DML Commands

Learn and Practice:

Sql for beginners



- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
 - Installation and Setup
 - Data Definition Language
 - More On Alter Table
 - Data Manipulation Language
 - Selecting from a Table

Mandatory Hands-on (Platform: Tekstac)

- Insert Records Department
- Department name based on block number
- Delivery Partner details based on rating
- Car & owner details based on car type
- Hotels that took order based on month.

Additional Hands-on

Car rental system - Create Table

- Car rental system add new column
- Hunger eats change datatype
- Hunger eats Change the field name

Day 7

Database design

Operators, Aggregate, String, Date Functions, Joins, Sub queries

Learn and Practice:

Sql for beginners



- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
 - Selecting From Multiple Tables
 - Database Design
 - Aggregate Functions
 - Subqueries
 - MySQL Functions String Functions and Date Functions

Mandatory Hands-on (Platform: Tekstac)

- Student and their Department Based on City
- Concatenating Details
- Password generation
- Customers using HDFC BANK
- Rental details based on date
- car rental system Insert values
- Hunger eats update table
- Customers having gmail id
- Car details based on type and name
- Hotel info

Additional Hands-on

- Total sale daywise
- Hotels not taken orders in a specific month
- Hotels that took order more than five times
- Maruthi car owner details
- Cars not taken for rent
- Customer mail details
- Order details
- Buses based on source and destination
- Number of tickets booked
- No of time rented by each car
- Credential details

Technical Quizzes:

• Quiz 1 - Database concepts

• Quiz 2 - ANSI SQL



Practice Case Study

• Implement SQL specification of truYum

Additional learning

 Please go thru the links on SQL Rank function and Introduction to NoSQL in the platform

Assess-Type-1: Code Challenge (Platform: Tekstac)

• All code challenges

Stage 1: Milestone 3 - Schedule

Overall Duration (including Behavioral Modules): 8 days

Milestone 3 will be focusing on Java Programming along with behavioral skills*

Udemy learnings are recommended in the Platform to understand the fundamental concepts. Apply the concepts learned and solve the Hands-on and Practice Case studies as recommended below

Note:

Recommended Hands-on needs to be completed.

Additional Hands-on can be taken up for better understanding on the concepts based on the availability of time.



Core Java

Continuous Learning: Technical Enablement

Overview, First Java Program, Variables, Datatypes, Literals, Operators, Expressions and Conditional Statements.

Learn and Practice



Java In-Depth: Become a Complete Java Engineer!.

- o Java: A High-level Overview
- Skip installation steps.
- o Implement the HelloWorld Program along with the author.

Core Java Made Easy.

- Datatypes, Literals, Variables, Type Conversion, Casting & Promotion
- o Operators and Assignments
- Flow Control Statements
 - Flow Control Statements Introduction
 - IF-ELSE
 - Assignment 2: If Else Ladder

^{*} Please refer the link for providing the user inputs from the console for Java samples.

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Display Characters
- Fuel Consumption Calculator
- Highest Placement

Additional Hands-on

- Bill Generation
- Movie ticket calculation

Continuous Learning: Technical Enablement

Overview, String, Arrays, Looping Statements, Methods, Class, Object, static.

Learn and Practice

1

Core Java Made Easy.

- Flow Control Statements
 - Switch, While, Do-While, For Loop, Break, Continue
- Static Members and their execution control flow.
- o Non-Static Members and their execution control flow.

Java In-Depth: Become a Complete Java Engineer!.

- o Classes, Objects and their Members.
 - Chapter Introduction
 - Class & Objects

Core Java Made Easy.

- o String Handling
- Arrays

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Least offer
- String Concatenation
- Ticket Price Calculation Static
- Student Details Constructor

Additional Hands-on

- Increment Calculation
- Find Average Age

Day 10

Core Java

Continuous Learning: Technical Enablement

Access Modifiers, Packages, Inheritance, Abstraction.

Learn and Practice

Go through below mentioned sections and implement the examples along with the author.



Core Java Made Easy.

- o Access Modifiers
- Packages
- Event Management Use case
- o Inheritance
- Abstraction

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Contact Details of Hosteller
- Account Manipulation Abstract class

Additional Hands-on

Shape - Area Volume Calculator

Additional Learning:

Technical Quizzes:

- Quiz Java Operator, Control flow statement
- Quiz Applying Object Oriented Concepts in java

Continuous Learning: Technical Enablement

Polymorphism, Encapsulation, Interface, Object Methods

Go through below mentioned sections and implement the examples along with the author.



Core Java Made Easy.

- Polymorphism
- o Encapsulation
- Object class methods

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- BankAccountDetails
- Employee Loan Eligibility Polymorphism
- Vehicle-Loan-Insurance Use Interface

Day 11

Note: Behavioral skills will be covered in this week for 3 hours.

Core Java

Continuous Learning: Technical Enablement

Collection Framework, ArrayList, Map, Set.



Go through below mentioned sections and implement the examples along with the author.

Core Java Made Easy.

- Collections with Generics
 - Collections Introduction
 - List Introduction
 - ArrayList Hands On
 - Restricting the ArrayList Type
 - Inserting and Replacing Objects
 - addAll and contains Methods
 - size get and remove Methods
 - Set Introduction
 - Using HashSet
 - Different Set Classes
 - Iterator
 - ListIterator
 - Comparable and Comparator
 - Create a StringBuffer Comparator
 - Sort Strings by Length
 - Sorting Objects
 - Create a Object Comparator
 - Map Introduction
 - HashMap Demo

- Arrays and Collections Classes
- Collections Sort
- Reversing a List
- Arrays sort()
- Array to List conversion
- Generics
- Generic class structure
- Create your own Generic Class

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Insurance Bazaar
- Number of New Words
- Phone Book Manipulation

Additional Hands-on

- Count of Each Words
- Book Manipulation

Additional Learning:

Technical Quizzes:

Quiz - Collections Framework



Core Java

Continuous Learning: Technical Enablement

File Handling, Annotation, Threads and Garbage Collections, Exception Handling, Enums.

Go through below mentioned sections and implement the examples along with the author.



Core Java Made Easy.

- o IO Streams (File IO)
 - IO Streams Introduction
 - Read a File Using FileInputStream
 - Copy A File using FileOutputStream
 - Using Reader And Writer
- Java Annotations
 - Introduction
 - Using @Deprecated
 - Using @Override
 - Using @SuppressWarnings

- Multithreading
- o Garbage Collection & Types Of Objects
- Exception Handling and Assertions
- Enums

Go through the below mentioned topics.

String Tokenizer

Number Class

Calendar

Resource Bundle

Currency

Comparable Interface

Math

Class loader

System

<u>Process</u>

Runtime

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Array Manipulation Use try with multi catch
- Employee Promotion
- Register a Candidate User defined Exception(with throw and throws)
- · Retrieving Data from file

Additional Hands-on

- Visitors Details
- Divide two numbers Use finally

Day 13

Core Java

Continuous Learning: Technical Enablement

Java 8 Features - Lambda Expressions, Streams, Filters, java.time.

Go through below mentioned sections and implement the examples along with the author.



Core Java Made Easy.

Java 8 Features

Java In-Depth: Become a Complete Java Engineer!.

o Date & Time API ~ Covers Java 8 & also Legacy API

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Mall Parking System
- Validate Name
- Travel Agency
- · Fruit Basket Estimation

Additional Hands-on

- Participant List Manipulation
- College Account



Core Java

Continuous Learning: Technical Enablement

Java 8 Features - Streams and Optionals. Asynchronous and Parallel Programming in Java 8

Go through web pages for learning below specific topics

Serial Sort Vs Parallel Sort

Asynchronous and Parallel Programming

Streams

Optional

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Employee Loan Eligibility
- Placement Enrollment Count
- Auditing

JDBC

Continuous Learning: Technical Enablement

Introduction, Connection, Statement, Prepared Statement, Callable Statement, Transactions and Meta Data.

Learn and Practice

Java Database Connection: JDBC and MySQL.



- Go through entire course.
- Implement the examples along with the author.

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

- Add Flight using JDBC
- Search for Trains JDBC
- Player Selection System_JDBC

Day 15

Additional Learning:

Technical Quizzes:

Quiz - Advanced Java Concepts

Additional Hands-on

- Retrieve customer count based on loan type_JDBC
- Retrieve ID and Price of mobiles with in the range_JDBC

Assess-Type-1: Code Challenge (Platform: Tekstac)

• All code challenges

Day 16

Note: Behavioral skills will be covered in this week for 3 hours.

TruYum Practice Case Study - Java

Stage 1: ICT Prep up and ICT.

Day 17

TruYum Practice case study – JDBC

Mock ICT

Day 18

Integrated Capability Test (ICT) (Platform: Tekstac)

ICT

Stage 2: Milestone 1

Overall Duration (including Behavioral Modules): 5 days



Maven

Needs and benefits, Maven Project Creation, POM.xml, Build lifecycle, repositories, Scopes and Profiles.



Refer this <u>document</u> for Maven Installation and Web Project Creation.

Go through the below mentioned sections and perform maven build along with the author of this course.

Maven Crash Course.

- Introduction
- Maven Project Creation and Key Concepts
- o Scopes
- Profiles

Core Spring

Setter Based Injection

Learn and Practice



Go through the below mentioned sections and implement examples along with the author of this course.

Spring Framework in Easy Steps

- Introduction
- Software Setup
 - Troubleshooting Maven Projects
- Setter Injection
 - Create a Maven Project
 - Create the Java Bean
 - Create the Spring Configuration
 - Create and run the test
 - Value as attribute
 - Using p:schema or p: namespace

Mandatory Hands-on (Platform: Tekstac)

- DBConfig-SetterBasedInjection
- EZEE Transport



Core Spring

Injecting collections, dependency check, Inner Beans and Scope.



Go through the below mentioned sections and implement examples along with the author of this course.

Spring Framework in Easy Steps

- Setter Injection
 - Injecting Collections

- List Create the Spring Bean
- List Create the Configuration file
- List Create the Test
- Running the test and flow
- Two More Things About List

Mandatory Hands-on (Platform: Tekstac)

• CurrencyConverter-Collections (Refer section 4.34 and 4.35 of Udemy course to implement this hands on)

Learn and Practice



Spring Framework in Easy Steps

o Dependency Check, Inner beans and Scopes

Mandatory Hands-on (Platform: Tekstac)

- Customer-Address-Scope
- Customer-Address Inner Bean

Day 21

Note: Behavioral skills will be covered in this week for 3 hours.

Core Spring

Constructor based Injection, Spring Core Concepts, Autowiring, Usage of Properties.

Learn and Practice



Spring Framework in Easy Steps

- Constructor Injection
- Spring Core Concepts
- Using Properties

Mandatory learning

Spring Resource bundle with ResourceBundleMessageSource example

Mandatory Hands-on (Platform: Tekstac)

- Constructor Injection
- Engine Analysis

Learn and Practice

Spring Framework in Easy Steps



Auto-Wiring

Mandatory Hands-on (Platform: Tekstac)

Autowiring

Core Spring

Stereotype Annotations, Injecting Interfaces

Learn and Practice

Spring Framework in Easy Steps



- Stereotype Annotations
- o Injecting Interfaces

Mandatory Hands-On

- · EBanking Hands on
- Passport Service

Additional Hands-On

Patient Management



Core Spring

Continuous Learning: Technical Enablement

Aspect Oriented Programming (AOP) using Spring AOP and AspectJ.



- Spring Framework in Easy Steps
 Spring AOP
 Implement the examples along with the author.

Continuous Learning: Technical Hands-on Mandatory Hands-on (Platform: Tekstac)

Spring AOP Demo

Agile Basics

The key concepts and tools of Agile Development, Agile Project Delivery and Agile Project Management.

Learn and Practice



Agile Crash Course: Agile Project Management: Agile Delivery

Go through entire course

Day 23

Core Spring

Continuous Learning: Technical Enablement

Spring JDBC

Learn and Practice



Spring Framework in Easy Steps

- Spring JDBC
- Implement the examples along with the author.

Continuous Learning: Technical Hands-on

Mandatory Hands-on (Platform: Tekstac)

Billing Software Application

Additional Hands-on

EBill

Assess-Type-1: Code Challenge (Platform: Tekstac)

All code challenges

Stage 2: Milestone 2

Overall Duration (including Behavioral Modules): 4 days



JUnit

Writing basic tests, Assert Statements

Learn and Practice

Go through the below mentioned sections and implement examples along with the author of this course.



Learn Java Unit Testing with Junit & Mockito in 30 Steps

- o Introduction
- Unit Testing with Junit
 - JUnit Step 1 : Why is Unit Testing Important?
 - JUnit Step 2 : Setting up your first JUnit
 - Step 03: First Successful JUnit. Green Bar and assertEquals
 - Step 04 : Refactoring Your First Junit Test
 - Step 05 : Second JUnit Example assertTrue and assertFalse
 - Step 06 : @Before @After
 - Step 07 : @BeforeClass @AfterClass

Mandatory Hands-on (Platform: Tekstac)

- Electricity Bill
- · Testing using Assertion.

Additional Hands-on

Loan EMI Calculator

Day 25

JUnit

Testing Exceptions, Comparing Arrays, Parameterized Tests, Test Suites.

Learn and Practice

Go through the below mentioned sections and implement examples along with the author of this course.



Learn Java Unit Testing with Junit & Mockito in 30 Steps

- Unit Testing with Junit
 - Step 08 : Comparing Arrays in Junit Tests
 - Step 09 : Testing Exceptions in Junit Tests
 - Step 10 : Testing Performance in Junit Tests
 - Step 11 : Parameterized Tests
 - Step 12 : Organize JUnits into Suites

Mandatory Hands-on (Platform: Tekstac)

- Product Login Test Suite
- Parameterized

Mockito

Learn and Practice



Learn Java Unit Testing with Junit & Mockito in 30 Steps

- Getting Ready for Mockito
- Need For Mockito
- Mockito Basics

Continuous Learning: Technical Hands-on Mandatory Hands-on (Platform: Tekstac)

- Verify Call JUnit using Mockito
- TestMockDB

Additional Hands-on

Test Callback



Note: Behavioral skills will be covered in this week for 3 hours.

Test Driven Development

Test Automation, Test Code Optimization and Test Driven Development

Learn and Practice

Go through the below mentioned sections and implement examples along with the author of this course.



Learn TDD in 24 Hours

- Getting started with automated tests.
- Taking care of the test code
- Test-Driven Development



Code Quality

The concepts include importance of code quality and coding standards.

Master class

To be driven by SME.

Learn and Practice

Refer this document.

Mandatory Hands-on (Platform: Tekstac)

Hands On - LMS Refactoring

Additional Learning

Please go thru the links on PMD, Checkstyle, FindBugs, SONAR in the platform

Assess-Type-1: Code Challenge (Platform: Tekstac)

All code challenges

Stage 2: Milestone 3

Overall Duration (including Behavioral Modules): 6 days



Servlets and JSP

Overview, Understanding Servlets, Web Application Request Flow.

Learn and Practice

11

Java In-Depth: Spring MVC For Beginners - Build Java Web App in 25 Steps.

o Part 1: Basic Java Web Application with JSP and Servlets.

Additional Learning:

 Please go thru the links on Web and Application Servers, MVC frameworks in the platform

Spring MVC using Spring Boot

Spring initializer, https://start.spring.io,pom.xml, @SpringBootApplication, SpringApplication.run (), Controller, @RequestMapping, @ResponseBody

Learn and Practice

Go through the below mentioned sections and implement examples along with the author of this course.

Learn Spring Boot in 100 Steps - Beginner to Expert.



- Web Application with Spring Boot
 - Introduction
 - Skip Installation steps.
 - Step 0 : Web Application with Spring Boot Section Introduction
 - Step 01: Part 1 Basic Spring Boot Web Application Setup
 - Step 01: Part 2 Pom.xml, Spring Boot Application and application properties
 - Step 02: Part 1 First Spring MVC Controller, @ResponseBody, @Controller
 - Fastest Approach to Solve All Your Exceptions
 - Step 02: Part 2 Understanding HTTP Request Flow

Step 03: Demystifying some of the Spring Boot magic

Day 29

Spring Boot Web Application

View Resolver, @RequestParam, ModelMap,Dispatcher Servlet, Spring MVC Web request flow, Web Application Architecture, Session scope, Request scope, @SessionAttributes.

Learn and Practice

Go through the below mentioned sections and implement examples along with the author of this course.



Learn Spring Boot in 100 Steps - Beginner to Expert.

- Web Application with Spring Boot
 - Step 04: Redirect to Login JSP -
 - @ResponseBody and View Resolver
 - Step 05: Show userid and password on welcome page ModelMap and @R...
 - Step 06: DispatcherServlet and Spring MVC Flow
 - Step 07: Your First HTML form
 - Step 08: Add hard-coded validation of userid and password
 - Step 09: Magic of Spring
 - Step 10: Create TodoController and list-todos view. Make TodoService a @S...
 - Step 11: Architecture of Web Applications
 - Step 12: Session vs Model vs Request- @SessionAttributes
 - Step 13: Add new todo

Mandatory Hands-on (Platform: Tekstac)

Zee Zee Login

Spring MVC using Spring Boot

JSTL tags, Spring MVC form tag library, Validations, initBinder

Learn and Practice

Go through the below mentioned sections and implement examples along with the author of this course.

11

Learn Spring Boot in 100 Steps - Beginner to Expert.

- Web Application with Spring Boot
 - Step 14: Display Todos in a table
 - using JSTL Tags
 - Step 15: Bootstrap for Page Formatting using webjars
 - Step 16: Let's delete a Todo
 - Step 17: Format Add Todo Page and Adding Basic HTML5 form validation
 - Use modelAttribute instead of commandName
 - Step 18: Part 1 Validations with
 - Hibernate Validator Using Command ...
 - Step 18: Part 2 Using JSR 349 Validations
 - Step 19: Updating a todo
 - Step 20: Let's add a Target Date for Todo Use initBinder to Handle Date Fields
- Step 25: Exception Handling

Mandatory Hands-on (Platform: Tekstac)

- HolidayParty-Validations
- BakingoCakeService
- Age Calculator

Day 31

Note: Behavioral skills will be covered in this week for 3 hours.

Spring MVC Internationalization (i18n) - implement internationalization using the Spring MVC framework.

Learn and Practice

Refer this document and implement the example.

Mandatory Hands-on (Platform: Tekstac)

- Front End-Internationalization
- Body Mass Index

TruYum Practice case study

Day 32

TruYum Practice case study

Technical Quiz:

• Quiz 1 - Spring MVC and Spring Boot

Assess-Type-1: Code Challenge (Platform: Tekstac)

- All code challenges
- Day 33

TruYum Practice case study

Stage 2: ICT Prep up and ICT.

Day 34

ICT Preparation

Day 35

Integrated Capability Test (ICT) (Platform: Tekstac)

ICT

Stage 3 - Bootstrap

Overall duration: 2 days

This module deals with topics on responsive web design using **Bootstrap**, a styling framework. This can be done using Notepad++ or Visual studio

Day 36

Note: Behavioral skills will be covered in this week for 3 hours.

Bootstrap – Introduction and basic component

Learning reference:

genc-web-ui-rwd-objectives

• Refer the objectives with session ld BTSP-T01 & BTSP-T02

Hands-On:

- Day 1 Session 1
- Day 1 Session 2

Day 37

Bootstrap – Form elements and Cards

Learning reference:

genc-web-ui-rwd-objectives

• Refer the objectives with session Id BTSP-T03 & BTSP-T04

Hands-On:

- Day 2 Session 1
- Day 2 Session 2

Stage 3: Spring Data JPA

Overall duration: 4 days

This module deals with topics on Spring Data JPA.

Day 38

Learning reference:

genc-spring-data-jpa-objectives

• Refer the objectives with objective ORM-001 to ORM-006

Hands-On:

Day 1 - Session 1 and 2

Day 39

Learning reference:

genc-spring-data-jpa-objectives

• Refer the objectives with objective ORM-007 to ORM-0010

Hands-On:

- Day 2 Session 1
- Day 2 Session 2

Day 40

Practice Check:

Step 1: Skeleton code (Standalone Core Java application) has been provided in the SharePoint link.

Step 2: Spring Core specification (truYum-spring-core-specification.docx) given should be implemented.

Step 3: Spring Data JPA specification (truYum-fse-spring-data-jpa-hibernate-specification.docx) should be implemented.

TruYum Practice Case Study Artifacts

Day 41

Note: Behavioral skills will be covered in this week for 3 hours.

Final Check:

Step 1: Skeleton code (Standalone Core Java application) has been provided in the SharePoint link.

Step 2: The movie list data for movie cruiser application now should be retrieved from spring configuration xml file and service layer should be introduced with autowiring of dao.

Step 3: Configure the persistence layer of the movie cruiser Spring application using Spring Data JPA.

Movie cruiser Case Study

Stage 3 –Lombok, Sonar

Day 42 43 44

Learning reference:

genc-spring-rest-objectives

Refer the objectives objective id SRW-006 to SRW-009

Reference Links:

http://www.javabyexamples.com/lombok-log4j-slf4j-and-other-log-annotations

https://projectlombok.org/

https://www.sonargube.org/

https://dzone.com/articles/how-quickly-get-started-sonar

Hands On:

Flight Management

Patient Intake System

Trainee Manager

Day 45 – Forenoon

SOLID principles, Need and benefits of Design patterns

Learning reference:

genc-DesignPrinciples-objectives

• Refer the objectives with session ld DP-T01

Hands-On:

Day 1 - Session 1

Day 45 – Afternoon

Design Patterns - Creational

Learning reference:

genc-DesignPrinciples-objectives

• Refer the objectives with session ld DP-T02

Hands-On:

Day 1 - Session 2

Day 46

Note: Behavioral training will be conducted for 3 Hrs. in the current week.

Creational and structural design patterns

Learning reference:

genc-DesignPrinciples-objectives

Refer the objectives with session ld DP-T03 & DP-T04

Hands-On:

- Day 2 Session 1
- Day 2 Session 2

Day 47

Structural and Behavioral design patterns

Learning reference:

genc-DesignPrinciples-objectives

• Refer the objectives with session ld DP-T05 & DP-T06

Hands-On:

- Day 3 Session 1
- Day 3 Session 2

Day 48

Practice Check:

• Practice Check Case Study

Day 49

Final Check:

<u>Final Check Case Study</u>

Stage 3 - Data structures and Algorithm

Data structures and Algorithms would be done on Hacker rank platform (https://www.hackerrank.com/).

Day 50

Data Structure

Linear Data Structure-Array, Stack, Queue, Linked list, Matrix

Learning reference:



Data Structures in Java - Part I (+INTERVIEW QUESTIONS)

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.
 - o Introduction
 - Arrays
 - Linked Lists
 - o Stacks
 - Queues

Hands-On:

- Hands On 1
- Hands On 2
- Hands On 3
- Hands On 4
- Hands On 5

Day 51

Note: Behavioral training will be conducted for 3 Hrs. in the current week.

Data Structure

Non-Linear Data Structure- Trees, Graphs

Learning reference:



Data Structures in Java - Part I (+INTERVIEW QUESTIONS)

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.
 - o Binary Search Trees

Go through the following links for better understanding of the other data structures

- Graph Data Structure
- Heap Data Structure
- Hash Data Structure

Day 52

Hands-On:

- Hand On 1
- Hand On 2
- Hand On 3
- Hand On 4
- Hand On 5

Day 53

Algorithm

Algorithm- Searching, Sorting, Pattern Searching, Divide and Conquer

Learning reference:



Algorithms and Data Structures in Java - Part II

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.
 - Substring Search
 - Strings
 - Basic Sorting Algorithm

Hands-On:

- Hands On 1
- Hands On 2
- Hands On 3
- Hands On 4
- Hands On 5

Online references:

https://www.geeksforgeeks.org/data-structures/

https://www.geeksforgeeks.org/fundamentals-of-algorithms/

Additional Hands-on reference:

Hands-on Problem Statements: Reference 2

Day 54 - Forenoon

Practice Check:

Hackerrank assessment – Practice

Day 54 – Afternoon

Final Check:

Hackerrank assessment - Final

Day 55

Learning reference:

genc-spring-rest-objectives

• Refer the objectives with objective SPRING-CORE-T01 and SPRING-REST-T02

Hands-On:

• Day 1 - Session 1 and 2

Day 56

Learning reference:

genc-spring-rest-objectives

• Refer the objectives with objective SPRING-REST-T03 and SPRING-REST-T04

Hands-On:

Day 2 - Session 3 and Session 4

Learning reference:

genc-spring-rest-objectives

• Refer the objectives objective id SRW-010 to SRW-011

Day 57 and Day 58

Practice Check:

Step 1: Standalone Core Java application) will be provided to you.

Step 2: Spring Restful Webservices specification should be implemented.

o TruYum Practice Check Specification

Day 59 and Day 60

Final Check:

- **Step 1:** Standalone Core Java application) will be provided to you.
- Step 2: Spring Restful Webservices specification should be implemented.
 - o Movie Cruiser Check Specification

Stage 4 – MicroServices

Day 61 to 63

Learning reference:

genc-microservices-objectives

- Refer the objectives with objective SPCLD-001 to SPCLD-005
- Refer the objectives with objective SPCLD-007 to SPCLD-012

Hands-On:

- Day 1 to 3
- Day 4 and Day 5

Day 64

o TruYum Practice Check Specification

Day 65

o Movie Cruiser Final Check Specification

Stage 4 – Kubernetes

Overall Duration: 2 days

Day 66

Learning Reference:

genc-AWS-Docker-DevOps-Objectives_FSE

Refer the objective with the objective Id AWS 08

Important:

- Trainer needs to explain the complete architecture of the Kubernetes cluster and various components in the cluster.
- Trainer needs to demonstrate installing Kubectl and Minikube and setting up a local cluster

Hands-On:

Setting up local kubernetes cluster

Day 67

Learning Reference:

genc-AWS-Docker-DevOps-Objectives FSE

Refer the objective with the objective Id AWS 08

Hands-On:

Deploying Simple Microservice in a Local K8S cluster

Stage 4 - AWS, CI/CD

Compute: Cloud Fundamentals, Network and Delivery, VPC, Security Groups, Gateway, NACL, Different Services Available in AWS

Overall Duration: 8 days

Day 68

Learning Reference:

genc-AWS-Docker-DevOps-Objectives_FSE

• Refer the Objectives with Objective Ids: AWS-001, AWS-002, ECC-001 to ECC-005, SSS-001 to SSS-003, AWSDB-001 to AWSDB-005, AWSNET-001

Hands-On:

- EC2-Hands-on
- <u>S3-Hands-on</u>

Day 69

Compute: Cloud Fundamentals, Network and Delivery, VPC, Security Groups, Gateway, NACL, Different Services Available in AWS

Learning Reference:

genc-AWS-Docker-DevOps-Objectives_FSE

Refer the Objectives with Objective Ids: AWS-001, AWS-002, ECC-001 to ECC-005, SSS-001 to SSS-003, AWSDB-001 to AWSDB-005, AWSNET-001

Hands-On:

RDS-Hands-on

AWS-lab-hands-on-practice.mp4

Day 70

Developer Tools: DevOps, AWS Code Commit, AWS CI/CD

Learning Reference:

genc-AWS-Docker-DevOps-Objectives_FSE

Refer the Objectives with the Objective lds: DevOps-001 and DevOps-002

Hands-On:

cicd-lab.mp4

Day 71

AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

Learning References:

genc-AWS-Docker-DevOps-Objectives FSE

Refer the Objectives with the Objective Ids: AWSSRV-001 to AWSSRV-003

Hands-On

Spring-REST-with-RDS-Backend

Note: <u>Trainer to demonstrate creating a simple "Hello World" Microservice, creating an image, pushing the image to the ECR, creating a container out the of image from ECR using the "Getting Started" wizard of ECS and deploy the application in ECS. Access the application from anywhere. Gencs to replicate the same demo done by the trainer.</u>

AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

genc-AWS-Docker-DevOps-Objectives_FSE

Refer the Objectives with the Objective Ids: AWSSRV-004 and AWSSRV-005

Hands-On:

- <u>Spring-Boot-Spring-Boot-Microservices-AWS-Fargate-ECS-CICD.mp4-AWS-Fargate-ECS-CICD.mp4</u>
- Swagger-Hands-on

Day 73

AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

genc-AWS-Docker-DevOps-Objectives_FSE

Refer the Objectives with the Objective Ids: AWSSRV-006 and AWSSRV-007

Hands-On:

Note: Client application should be created using Spring MVC instead of Angular.

Spring MVC Client for Spring REST Service

Day 74 and 75

Integrate: AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

Microservices with AWS and Spring Security

- <u>Practice Check</u> (Apply all the topics covered so far in Microservices and AWS with Spring Security)

Stage 4 – My First POD Engagement

Overall duration: 10 days

Every GenC will undergo MFPE towards the end of their learning journey. This will help them to apply the skills acquired on a business case study while being in Agile POD team.

Mentors will guide them throughout in this two weeks engagement. They also evaluate their coding standards and problem solving skills during their mentorship.

How to learn each day?

Each day has a set of learning objectives. These learning objectives can be met by going through the Udemy courses and by completing the hands on exercises mentioned in the daily plan.

The below strategies will help you decide the learning approach.

Learning Strategy & Approach

Find below few imaginary profiles. For each of these profiles we have defined a recommended learning approach. This is not an exhaustive list. The approaches below might help invent a new way of learning.

Profile #1



Harry Reacher

Engineering Discipline: Electronics Skills: Python, Ruby on Rails, nginx

Project: Mining Crime Data to get Route Cause Insights

Learning Approach to Programming Languages: I do not want to waste my time learning. I am more practice oriented. I want to work on the problem immediately

What will work for me?

- Directly complete hands on exercises
- Refer Internet or Udemy Courses
- If hands on are implemented early, clarify your friends questions and troubleshoot their issues

Profile #2



Olivia Richards

Engineering Discipline: Computer Science

Skills: Java, C, C++

Project: Library Management System

Learning Approach to Programming Languages: I have interest, but I don't know where to start.

What will work for me?

- Go through the recommended Udemy Course
- Try completing the hands on exercises
- Get your clarifications solved with help from Tech SME
- Get help from other learners in your batch whom had already completed

Profile #3



Greg Anderson

Engineering Discipline: Civil

Skills: C

Project: Fiber reinforced concrete

Learning Approach to Program ming Languages: I am scared of programming

languages. I haven't got my hands dirty with coding

What will work for me?

- Go through the recommended Udemy Course
- Implement the coding along with the author of the Udemy Course
- Try completing the hands on exercises
- Clarify queries with SME
- Troubleshoot programming issues with help from SME or learner from your classroom whom had already completed

- 1. Who can participate in this program?

 Students who have enrolled for Full Internship can participate in this program.
- Is there any pre-learning I should do?No. This program is open to all students from any academic discipline.
- 3. What is the significance of Hands-on in the overall learning journey?

Hands-on focuses on specific topics in a Skill, which you can try and execute in the Platform. Group of such Hands-on exercises will be packaged together as a Code Challenge. This Code Challenge will allow you to benchmark your skills in the learning journey.

4. What is an Integrated Capability Test (ICT)?
A case study problem statement will be provided to you, that you may need solve using the combination of Skills learnt in the given stage.

5. Whom do I reach out in case of any queries?

Coach is your point of contact.

6. Is there Code Challenge and ICT for Stage 3?
No, since it is not executed on Tekstak platform